Overview of **I N P E´**s **Activities** *and* ***Cooperation*** *with* ***NOAA***
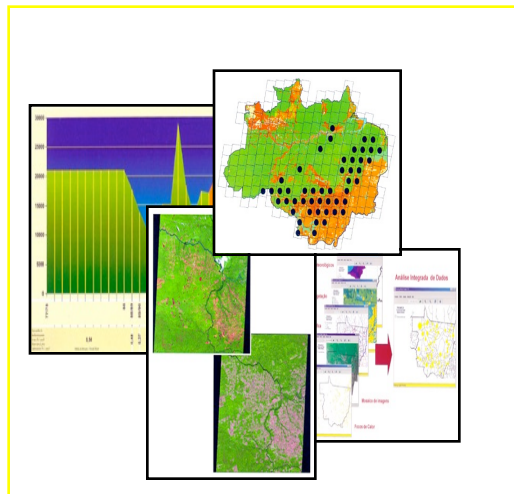
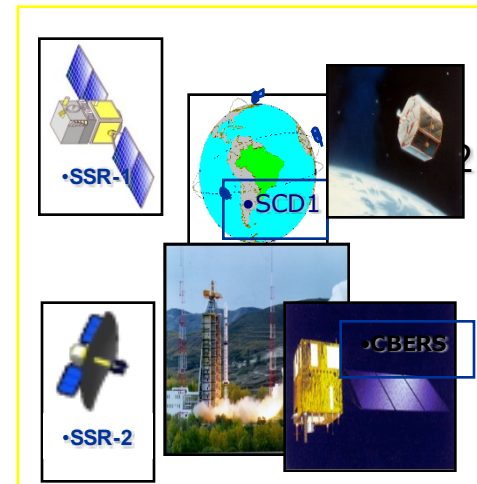Antonio Divino Moura

Head CPTEC/INPE
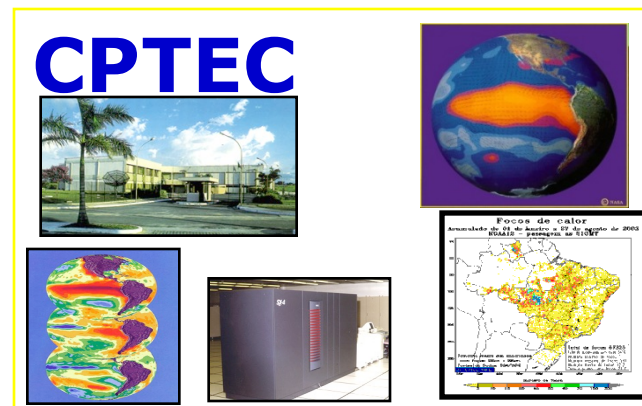
July 2017

INPE: Areas of Activities

Space Science

Earth Observation

Space Technology

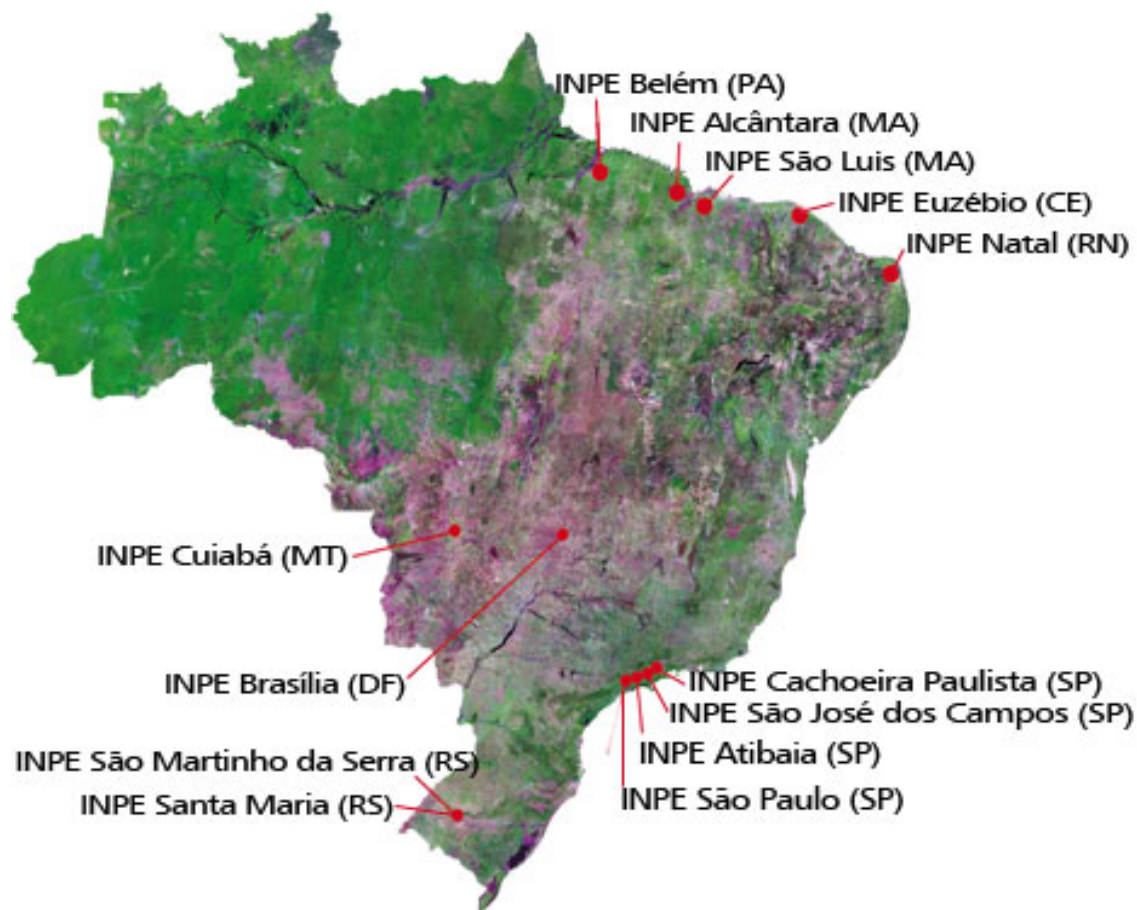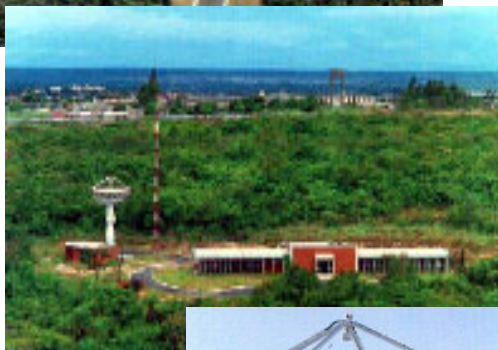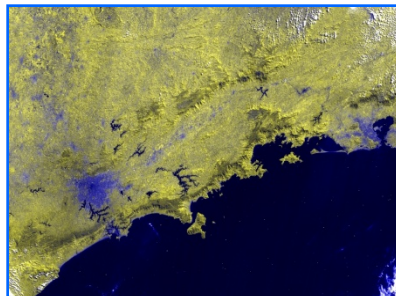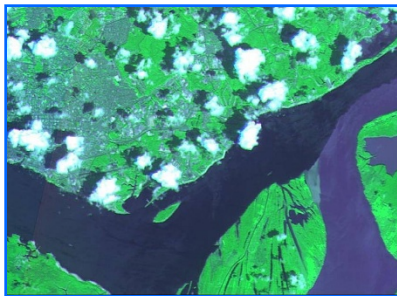**Earth System Science**

CPTEC

Weather and Climate

Location of Facilities

INPE Belém (PA)
INPE Alcântara (MA)
INPE São Luis (MA)
INPE Euzébio (CE)
INPE Natal (RN)
INPE Cuiabá (MT)
INPE Brasília (DF)
INPE Cachoeira Paulista (SP)
INPE São José dos Campos (SP)
INPE São Martinho da Serra (RS)
INPE Atibaia (SP)
INPE Santa Maria (RS)
INPE São Paulo (SP)
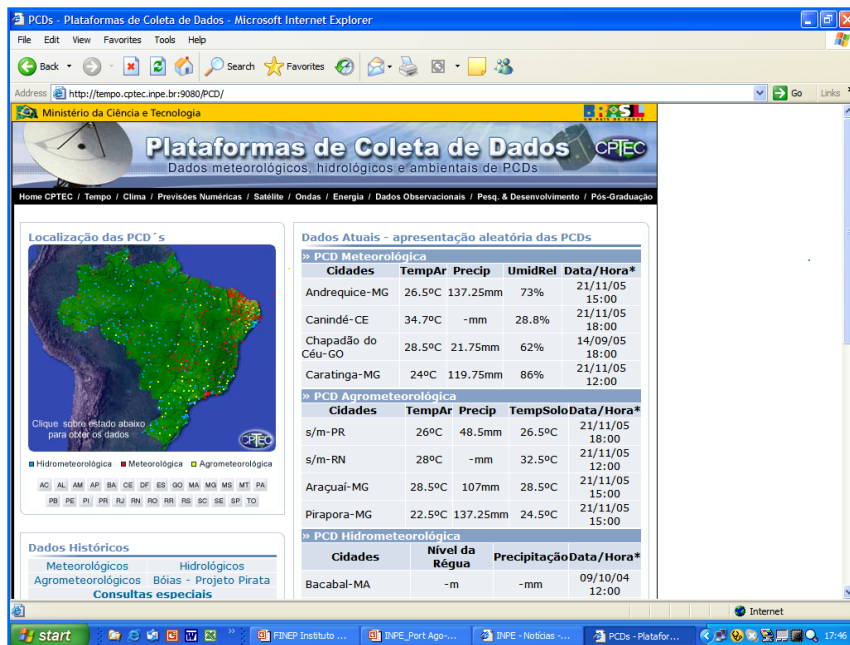
# Satellite Reception, Control and Tracking

- **Control and Tracking**
  - SCD 1-2
  - CBERS 4

- **Image and data reception**:

  - AQUA, TERRA, NOAA 12/16/17 e LANDSAT 5 (EUA)
  - SPOT (França)
  - RADARSAT (Canadá)
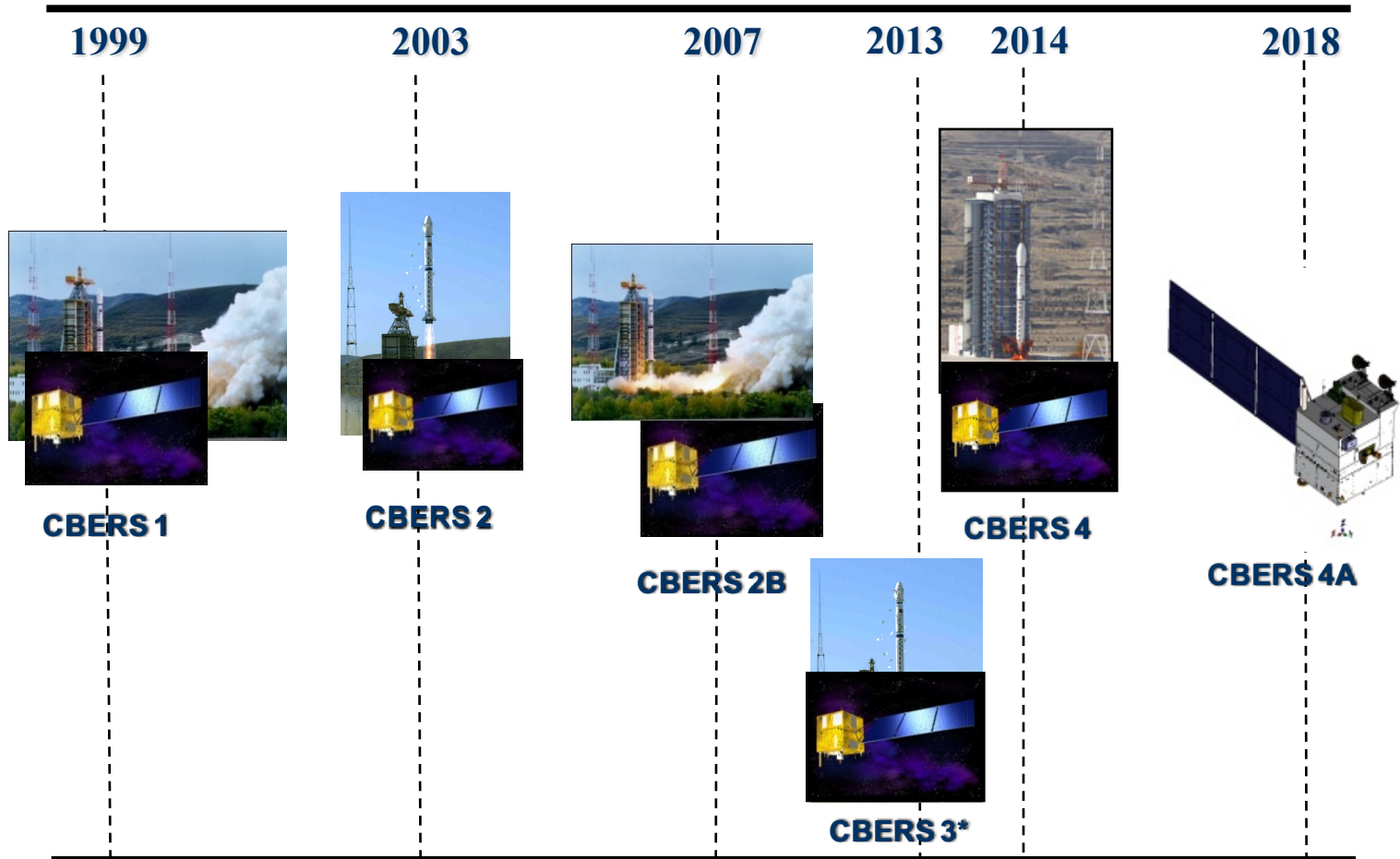 - ERS (ESA)
  - SCD1-2, CBERS 4 (Brasil)

Space Engineering and Technologies - ETE

- Technological development and industrial policy
  - ✓ Sino-Brazilian Program
    - ✓ CBERS 3&4
  - ✓ Application Satellites
    - ✓ Amazonia-1 Satellite
  - ✓ Brazilian Data Collecting System
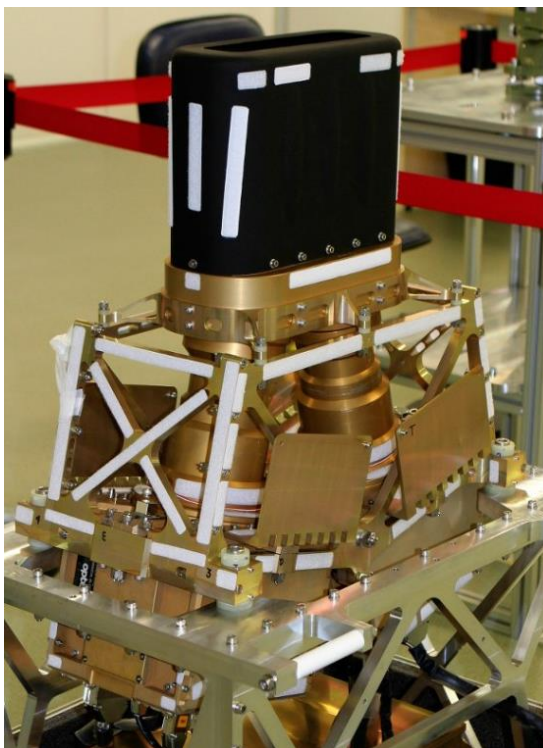

SCD2

SCD1
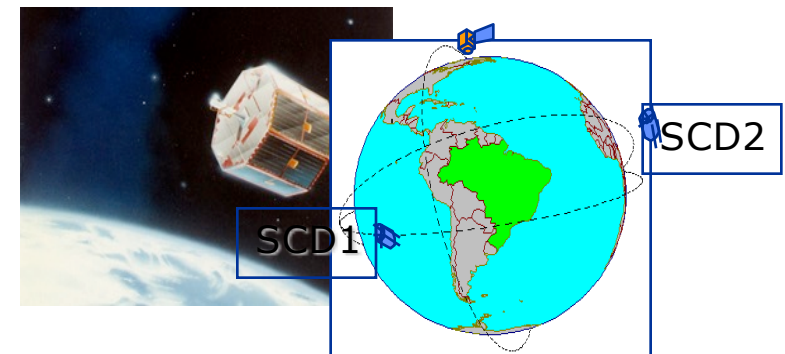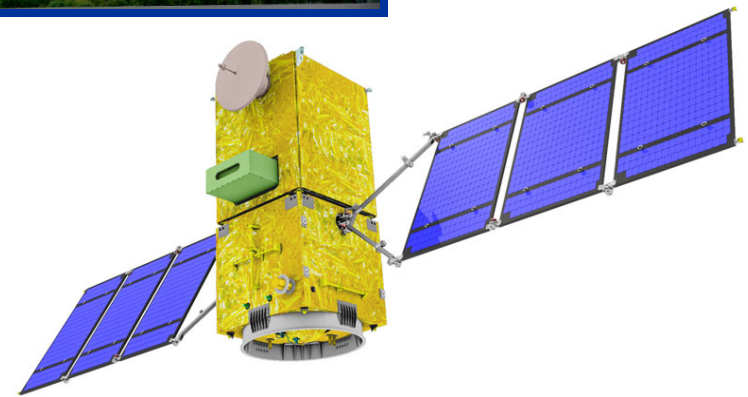
CBERS - Launching dates

* Due to a failure in the LM rocket, CBERS-3 was not placed into its required orbit. The satellite re-entered Earth's atmosphere.

Amazonia 1 Mission

Orbit Characteristics

- Sun synchronous, Height: 752 km
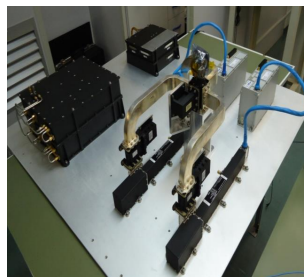- Local Time : 10:30 h (Descending Node)
- Revisit Time: 5 days

WFI Imager

- Swath: 850 km
- Resolution: 65 m (nadir)
- Spectral Bands: 4

4 Spectral Bands Wavelength(nm)

- 485, 555, 660 and 830 nm

AWDT Transmitter

- X Band (8025 - 8400 Mhz)
- 128 Mbits

Solid State Recorder

- Capability: 250 Gbits

Planned Launch Period: 2/2018 – 06/2019

Space and Atmospheric Sciences– CEA

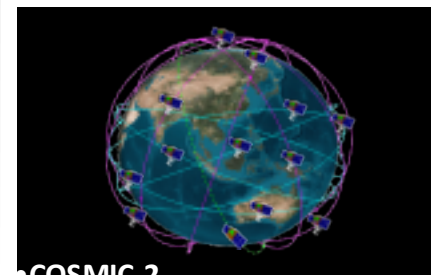Astrophysics   Space Geophysics

Aeronomy

Space Weather Service

NOAA-INPE COOPERATION

COSMIC-2

EMBRACE Magnetometers Network

Itapetinga
Radio Physics Observatory

Stratospheric Balloons
Launcher Sector
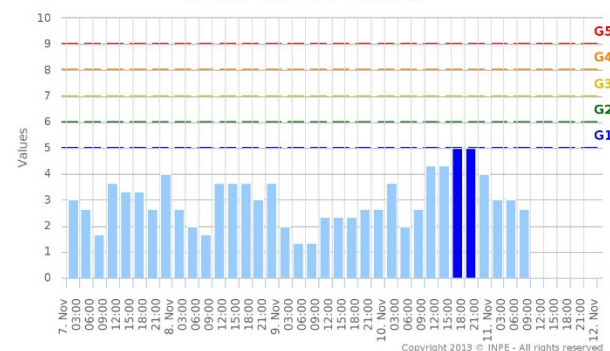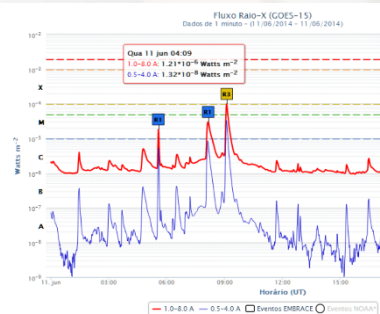
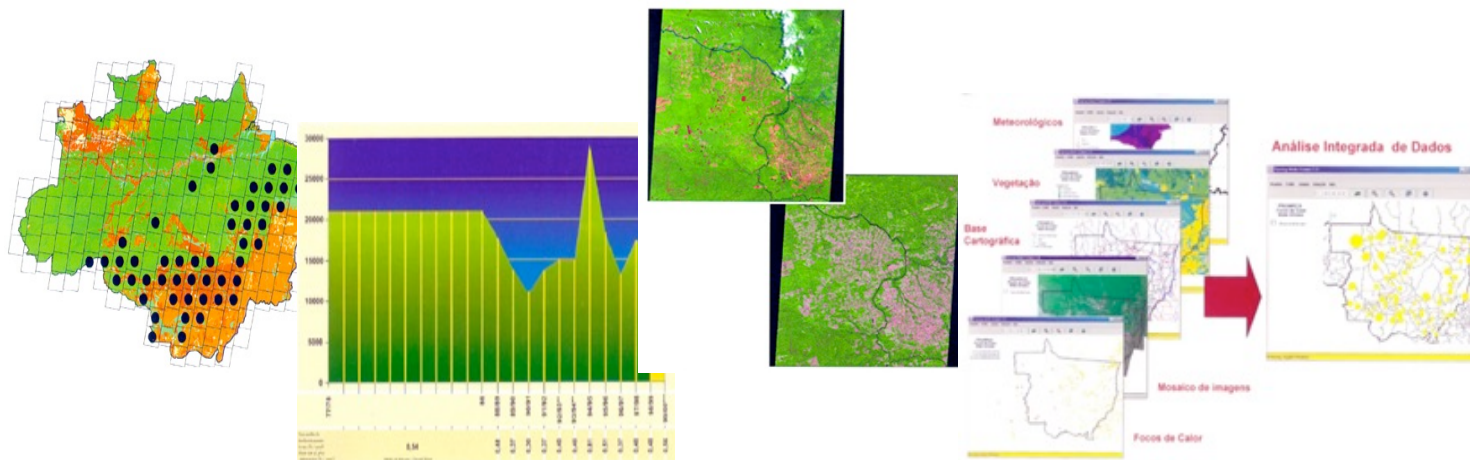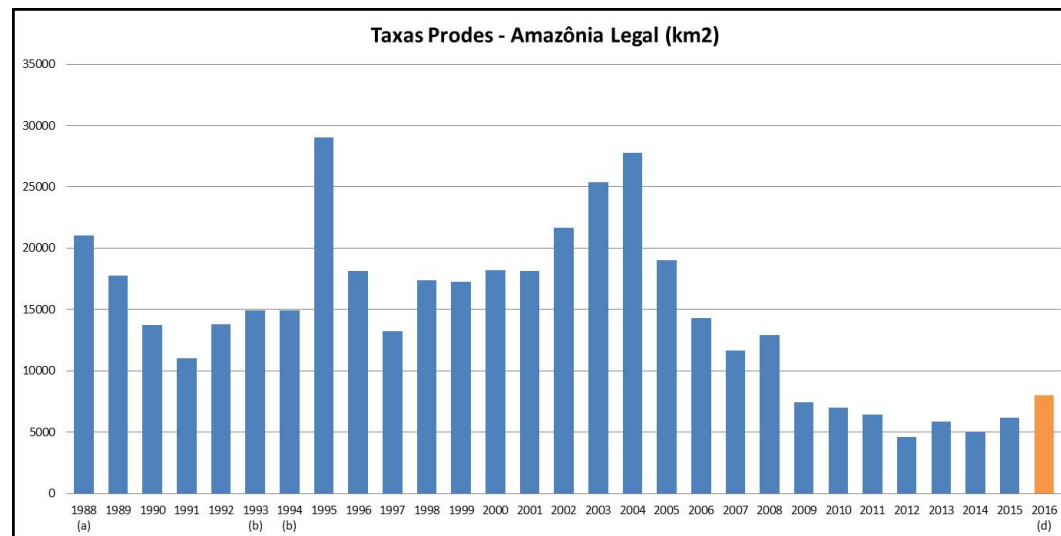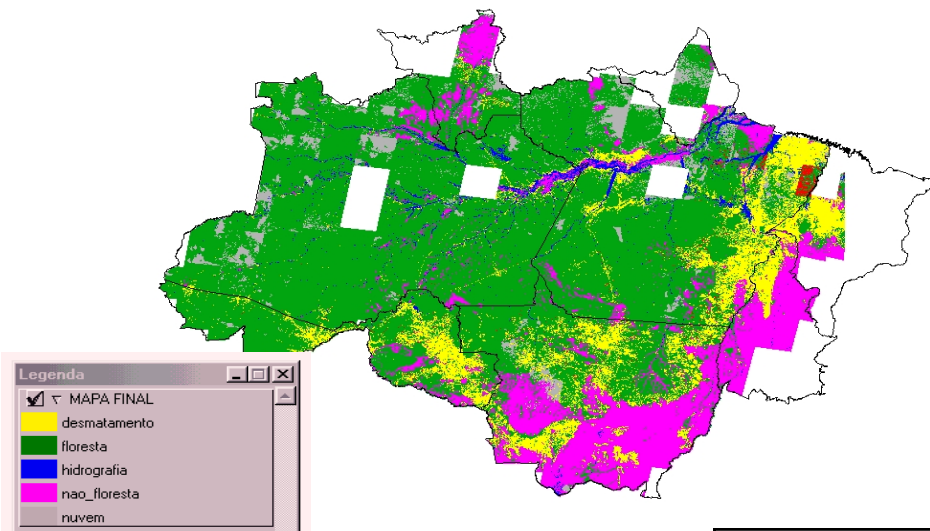# Earth Observation– OBT

- Remote Sensing Research: Geology, Water Resources, Oceanography, Ecosystems and Territorial Management and Monitoring.

- Technological Development: SPRING, Terralib, etc

- Amazonia Program – Deforestation Monitoring Forest Forest Fire Monitoring and Prevention

PRODES - Legal Amazon

http://www.obt.inpe.br/prodes/

Weather Prediction and Climate Studies CPTEC

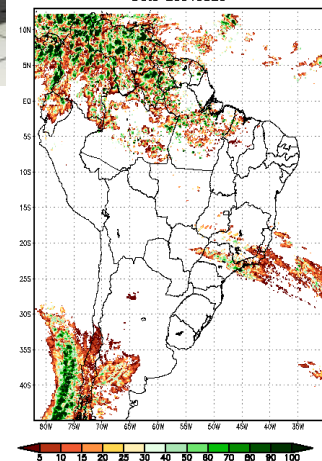- Numerical Weather and Climate Prediction

- Satellite Meteorology
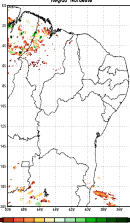
- Research and Development:
  - Weather forecasting and climate variability and change;
  - Climate and Hydrology of Amazon Ecosystems;
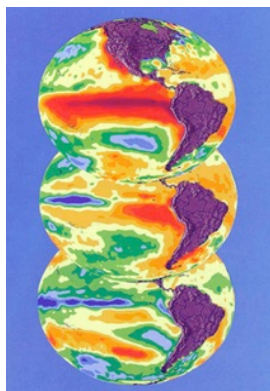 - Climate, Weather, Micro-Meteorology, Ocean-Atmosphere interaction and Marine Meteorology.
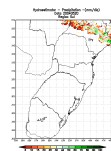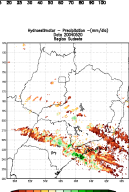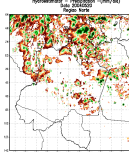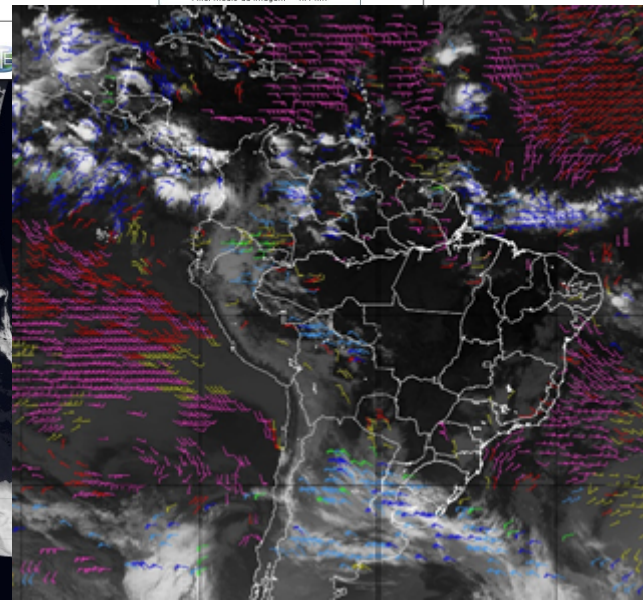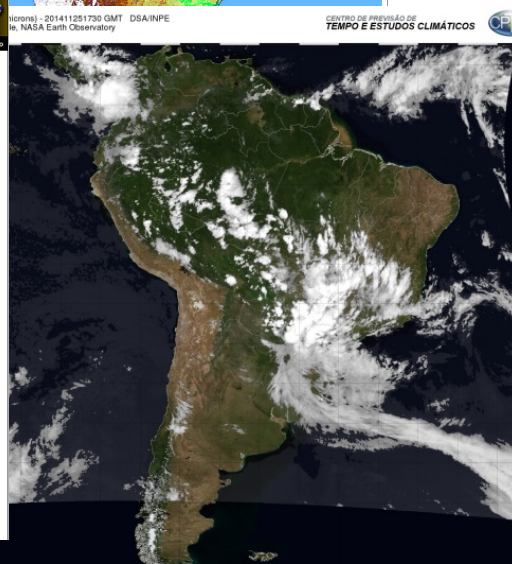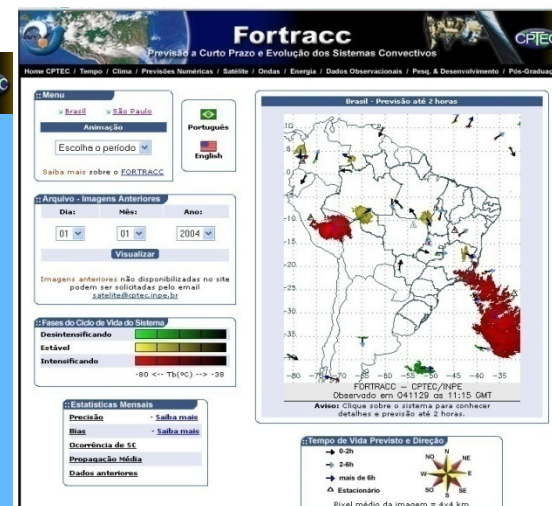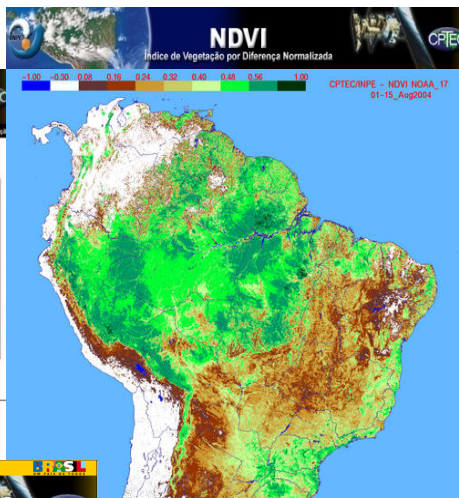
Models currently running

- Brazilian Atmospheric Model – Global 20km

- Regional Eta model – South America – 5km

- Environmental BRAMS model – S. America – 5km: air quality, fire emissions, urban and industrial emissions

- Oceanic global wave model (Wavewatch)

- New global model: 2017…Looking for Cooperation with NOAA and UCAR

Satellite Products – Satellite Division

Atmospheric Pollution and Forest Fires
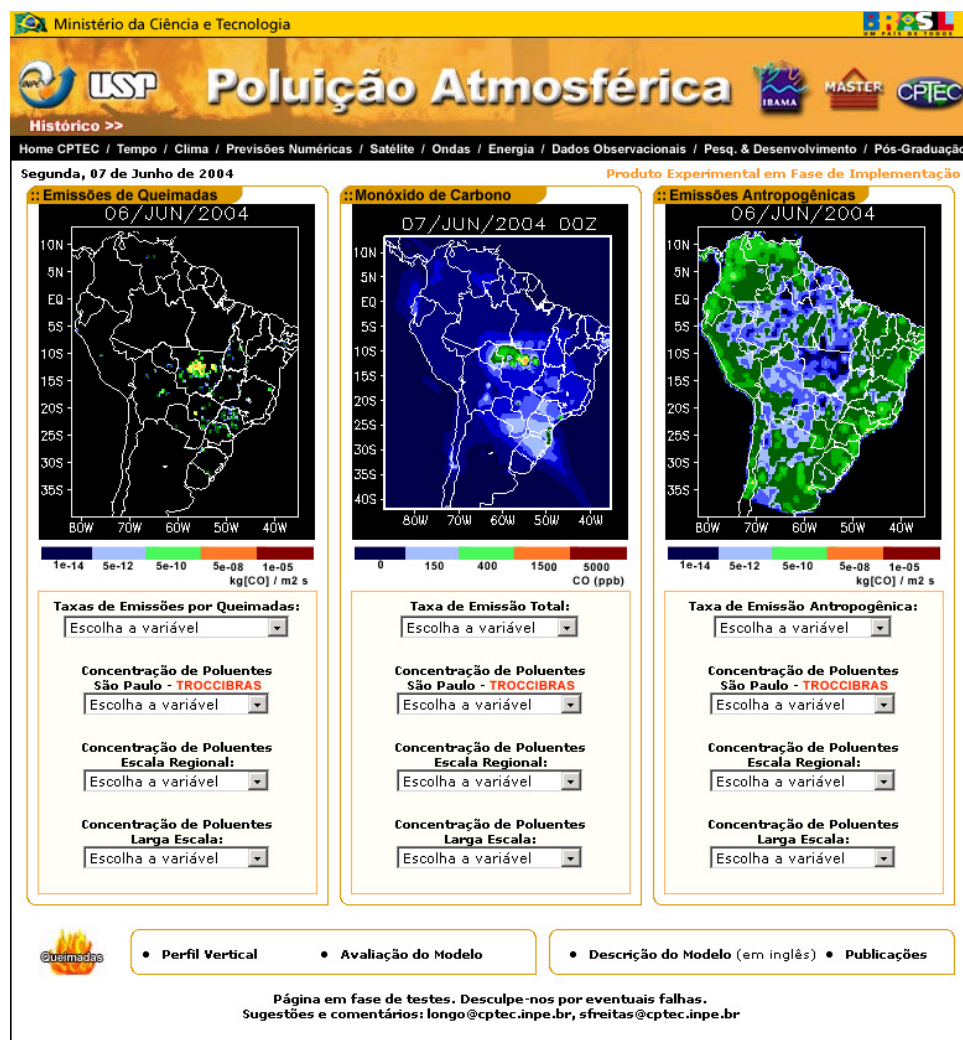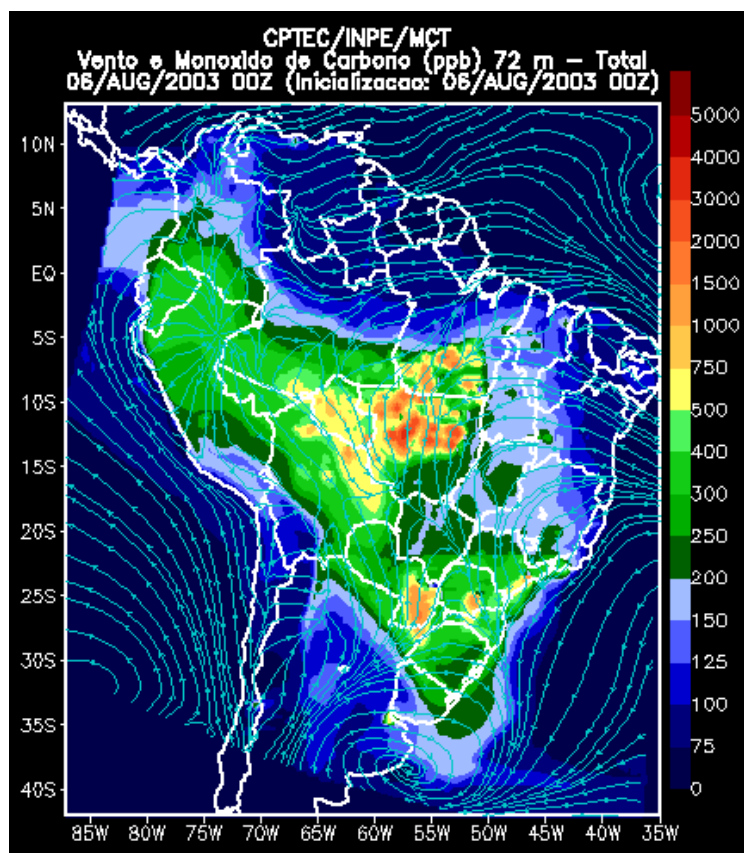
SEVERE WEATHER OBSERVATION SYSTEM - SOS

The Severe Weather Observation System (SOS is the acronym in Portuguese) monitors and provides near real time weather conditions like rainfall from satellite and radar, lighting ground instruments, fire, fog, severe weather warning, etc. Information are available by Web Service or Smartphones

The SIGMACast Project: **Training**

SigmaCAST
Satellite data and products

Application Server — Apache Tomcat

Map Server — GeoServer

Java   python   GDAL

PostgreSQL   GEONETCast
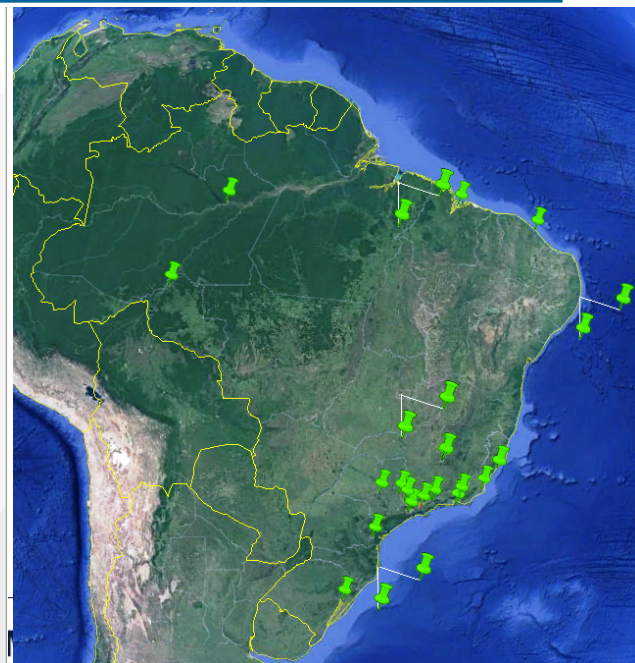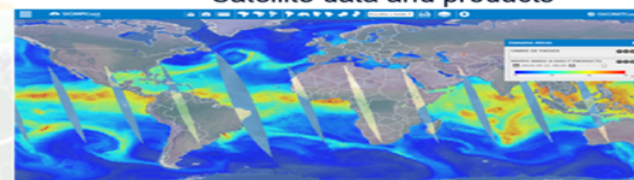
A BRIDGE BETWEEN DATA AND SOCIETY

CENTER of EXCELLENCE BRAZIL – *VIRTUAL LABORATORY*

INPE is part of the network of Regional Centers of Excellence for Training in Satellite Meteorology of WMO. As a Center of Excellence, INPE serves as a source of training for satellite Member countries of WMO to promote the ability of its members to use data satellites broadly and significantly, with particular attention turned to the needs of developing countries

Thank You!

L I T

Laboratory for Integration and Test